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Iron Wire Rope.

This material has now had sufficient time for a thorough testing, and for all purposes to which it has been applied, it has been found to answer much better than hemp. Its applicability for ships' rigging has been put to a careful test at Liverpool, when the following results were obtained:—3¾ inch galvanized wire rope broke at 20 tuns 15 cwt.; 3¾ inch Manilla hemp, do., 5 tuns 17 cwt.; 3¾ inch Russian hemp, do., 4 tuns 15 cwt.; 3¼ inch galvanized wire rope, do,, 16 tuns 10 cwt.; 2½ inch galvanized wire rope, do., 8 tuns 10 cwt.

How far these results may be counterbalanced in the matter of convenience, it belongs to experience only to decide. The *Liverpool Post* says, in reference to the superior strength of iron as shown in the above experiment:—

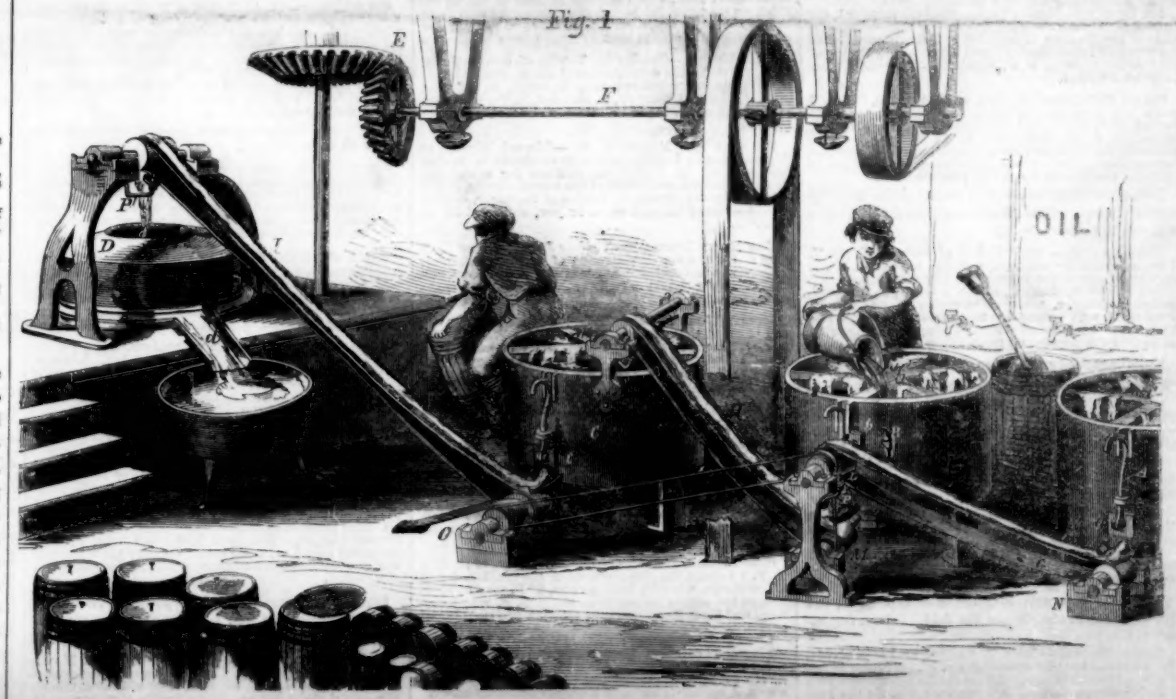
"But from a table handed to us we perceive that this is not the sole, or indeed we might almost say the greatest, of the advantages it presents. For instance, we observe that wire rope is a fourth less in weight, and not one-half the bulk of that made of the hemp of the relative strength and enduring capacity. The advantage of this, especially in beating to windward, needs no comment. Moreover, we are assured the cost is 25 per cent in favor of wire rope over hemp, estimating weight and saving. Again, wire-rigging is much less susceptible of atmospheric changes, the latter continually stretching. And when, in addition to all these advantages, it is remembered that wire rigging needs no stripping or refitting, as hemp rigging must have every few years, we cannot but come to the conclusion that wire rope seems destined ere many years to surpass, if it shall not entirely supersede, hemp rope in ships' standing rigging. Already, indeed, we see that for years it has been creeping into more general use; and if the approval of experience can add, as it must, to the value of scientific tests, the use of it will be even more than proportionately rapid, for those who have used it invariably prefer it over hemp."

Rifled Cannon Ball.

This projectile, about which so much has been said, is of elongated form, and by a simple and ingenious combination of cast and wrought iron, secures all the advantages of the Minie ball. Being entirely of iron, it has a great superiority in an economical point of view over the various forms of leaded cannon balls that have been proposed, and possesses the important advantage of being used red hot when desired. The only change necessary to adapt it to the ordinary form of cannon, is the cutting of two or three grooves in the gun. The invention insures an increase of range and accuracy in the fire of artillery, also an increased efficiency in direct shell firing.

DOLSON'S FEED FOR PAINT MILLS.

Fig. 1



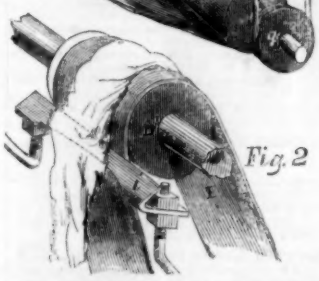
In the mixing of white lead and other paints, there are many difficulties to encounter, one of the greatest being in feeding the millstones regularly and constantly, so that an even and smooth paint may be obtained.

The process consists in first mixing the dry white lead with oil and then grinding this mixture into a smooth white mass. The invention we are about to describe relates to the conveying of the white lead from the mixers to the millstones, and so arranging them that there is always a continuous and regular supply given to the stones. It is as ingenious as simple and affords a better lead than has yet been made in America, being almost as stiff as the British and possessing a smoothness of tint that we have rarely seen equaled. Our large engraving gives a perspective view of the mixing and grinding room, which we will now describe.

A is an iron pan having in it a series of mixers, a', rotating, which are turned by an engine in the story below. B is another mixing pan, having mixers, b'; and C, another with mixers, c'; each of these pans is provided with doors and shutters in their lower part indicated by a, b, c. D are the millstones and d the shoot from it, by which the ground lead is discharged. E is the the bevel gearing turning the millstones; and F, the shaft that receives the power from the engine. Let us suppose that the mixing tub, A, is full and thoroughly mixed, while the charge in B is being prepared; the shutter, a, is drawn up and a continuous stream of lead falls on the

Fig. 3

Fig. 2



endless belt, G, being by it conveyed over the roller, L, seen in Fig. 3, when the scraper cuts it off, and lets it fall onto the endless band, H, which again conveys it into the mixer, C, from which it is taken by the endless belt, I, to D′, seen in Fig. 2, where the scraper, i, takes it off, thus allowing an even and regular stream to fall into the millstones. These endless belts are moved independently of the rest of the machinery by the belt, O, pulley, K, belt, J, which drives the pulley, L, the band, p, driving the pulley, g, and with it the endless belt, H. P is the shoot from the mixer B. The advantages gained by this arrangement are obvious: first by having the two mixers, A and B, in alternate action, the mixer, C, is always kept full of thoroughly mixed material, and supplies the millstones at an even rate; secondly, conveying the lead on the endless belts will only allow a given and definite quantity to be carried along, which must be regulated by the gates, a, b, or c, in accordance with the capability of the millstones, so that the process can never be hastened and an inferior quality turned out; and thirdly, there is great economy, as with 100 lbs. of lead, three quarters of a gallon of linseed oil are found sufficient to effect a thorough grinding, and no labor is required from the time the materials are put in the tubs to casking it up finished, thus adding to its value as a labor-saving apparatus.

This invention was patented the 3rd of November, 1857, and any information may be obtained by applying to the patentee, W. H. Dolson, 188 Avenue C, New York.

An American-built Russian Corvette Launched.

A steam corvette, to carry twelve guns, built for the Russian government by Wm. H. Webb, this city, was successfully launched on the 16th inst., with her propeller and a portion of the main shaft in place. It was feared that this heavy weight at the extreme end might spring her amidships; but not the least variation in her shear was perceptible after launching, thus demonstrating the great strength of her construction. Her extreme length is 214 feet; breadth of beam, 36 feet; depth of hold, 18 feet. Her engines, which are oscillators of 350 horse power, are now building at the Novelty Works, and they will be fitted up during the winter. She will be finished early in the spring, and proceed direct to the river Amoor.

This, we believe, is the second steam vessel of war which has been built for the Russian government in New York. Thus it is, the New World is leading the Old. American divers are engaged to raise the sunken vessels at Sevastopol, and Americans build Russian railroads and steam vessels of war.

Gunpowder.

Henry Hodges, of New York, has patented an improvement in the manufacture of this article in Great Britain, consisting in mixing the ingredients or component parts of gunpowder (namely, charcoal, saltpeter and sulphur) in their usual proportions in the ordinary way, and in then putting them into a suitable pot or vessel, made of any description of metal or earthenware, into which vessel sufficient steam is admitted by any suitable apparatus to damp the composition, dissolve the saltpeter, and soften the sulphur. By these means the saltpeter is more intimately blended with the other ingredients than by ordinary processes of manufacture. During this process the composition should be kept well stirred up, to expose it as much as possible to the action of the steam, and this may be continued until the whole of the saltpeter is dissolved, when it is taken out, and when sufficiently dry it is ground under the mill runners in the usual way, and packed in barrels for sale.

Issued from the United States Patent Office

FOR THE WEEK ENDING NOVEMBER 17, 1857.

[Reported officially for the Scientific American.]

RINGING BELLS—James R. Baird, of Vincennes, Ind.: I do not claim ringing an elevated bell from a position below it by means of a flexible or jointed frame, when said frame is attached directly to the axis on which the upper end of the tongue swings, as in the bell-ringing device patented in 1852 by Thomas V. Stran.

But I claim the direct attachment of the circular lever C, to the ball or lower end, D, of the tongue or clapper, and the combination of said lever thus attached with the vibrating cross head, E, and handle, I, by means of the pendulous rods, F F, substantially as and for the purposes set forth.

STRAW CUTTERS—Jesse Ball, of Barnesville, Ohio: I claim the reciprocating rack, H, operated from the knife frame, C, through the medium of the lever, E, projection, F, and bent lever, G, in combination with the compress L, adjustable and pressure lid, K, and stationary rack, J, the whole being arranged to operate conjointly as shown, for the purpose set forth.

[The straw in this machine is pushed to the cutter by means of a rack behind, thus preventing the slipping so common in pressure feeds.]

HUSKING CORN—David Bedell, of Seneca Falls, N. Y. I do not claim the knife, C, attached to the bar, B, nor do I claim any of the parts separately considered.

But I claim the knife C, attached to bar, B, in combination with bar, c, attached to spring, D, and rod, E′, attached to said spring by means of the lever, f, and link, e, the whole being arranged to operate conjointly, as and for the purpose set forth.

[This operates by the action of a cutting knife being suddenly made to cut through the butt.]

TELEGRAPHIC FIRE ALARM APPARATUS—Edward C. Clay, of Boston, Mass., I claim the snail, K, or its equivalent, and dial plate, in combination with the single key, U.

ELASTIC DOOR GUARD—William N. Clark, of Chester, Conn.: I claim the elastic door guard described, for the purposes set forth.

HARVESTING MACHINE—John C. Cox and Reuben Newton, of Greenville, N. C.: We do not claim separately either of the parts described.

But we claim the comb, G, in combination with the rotating teeth, i, and roller, f, constructed and arranged substantially as and for the purpose set forth.

[This harvester cuts only the ears of corn off, and leaves the stalk standing in the field. It is an ingenious device.]

BRICK MACHINE—John B. Collen, of Philadelphia, Pa.: I claim the perforated plates, F, operating as described, in combination with the inclined plate or apron j, the whole operating in the manner and for the purposes set forth.

INDIA RUBBER SPRINGS FOR UPHOLSTERY PURPOSES—Francis Colton, of New York City: I do not claim the discovery of the elastic property of a ring or cylinder of india rubber, when placed upon its circumference.

But I claim the form and combination of a vulcanized india rubber ring with the steadying post, together with the application of the same, in the manner and for the purposes specified.

CARPET FASTENER—Stephen Culver, of Newark, N. Y. I claim the method of securing carpets to floors by means and use of a metallic plate attached to the under side of the carpet, perforated to receive the head of a screw, and by such perforation hitched to a screw, or its equivalent, driven into the floor, in the manner and for the purposes set forth, so that the carpets may be put down and taken up at pleasure, without the use of tools.

CLOTHES CLAMP—Lewis H. Cushman, of Monmouth, Me.: I claim the combination of the spring and cam lever, as set forth.

WASHING MACHINE—Alexander Dickson, of Hillsboro', N. C.: I do not claim any of the parts when viewed in the abstract, for they are well known devices, and have been used separately for similar and analogous purposes.

But I claim the combination of the oscillating rubber, stationary bed, and the pumps, arranged to operate conjointly, as and for the purpose set forth.

[In this machine two rubbers act simultaneously, and between them the clothes to be washed are placed; they act in connection with two pumps, one at each end, which force water through the texture of the clothes, and wash the water away as fast as it is loosened.]

LIME KILNS—Powell Griscom, and Charles S. Denn, of Baltimore, Md.: We do not wish to be understood as claiming any of the parts separately.

But we claim the peculiar combination and arrangement of the parts, as described, and for the purposes set forth.

EXTENSION TABLES—Henry Gross, of Tiffin, Ohio. I claim the combination of the two systems of stretchers, E and D, with the stay rods, a a, constructing and operating as and for the purposes set forth.

FLOUR DISTRIBUTING BOLT FOR GRINDING MILL—W. W. Haimer, of Cincinnati, Ohio: I disclaim the use of the conveyors for mere conveying purposes, as they have often been used for such before.

But I claim the exact combined arrangement of the conveyors, d and f, and their compartments, when united together with the openings, g, as represented and specified in the specification, for the purposes before mentioned.

HEMP CUTTER—John L. Hardeman, of Arrow Rock, Mo.: I claim first, The hinged trailing hemp platforms, approximating in form to a right angle triangle, and made with an inclined elevation, c d, and guard, e, and arranged in rear of the cutter beam on both sides of the machine, in such a manner that a broad central space shall be left for the cut hemp to be laid in, out of the way of the team, and the body of the machine, by said platforms, as and for the purposes set forth.

Second, The employment of the peculiarly constructed hemp trailing platform, J, in combination with the inwardly inclined beveled directing board H, arranged just above the trailing platform, for the purpose of directing the hemp angularly upon the platform, as described.

Third, The employment of a reel, having its blades bent spirally at one end to the axle or shaft, in combination with the inwardly inclining direction board or boards and trailing platform or platforms, as and for the purposes set forth.

SEWING MACHINES—N. W. Harrington, of Jamestown, N. Y.: I claim the looper composed of three fingers, s t w, arranged and operating together, in combination with the needle, as described.

[A new and improved looper is used in combination with a single thread, to produce the chain stitch. It makes a very good and useful machine.]

FLY FRAMES OF PRINTING PRESSES—Richard M. Hoe, of New York City: I claim operating the fly frames, I, by means of cam shafts, G, placed one at each end of the machine, and provided with cams, D E F, and used in connection with arms, j m p, rods, i l o, arms, K, and springs, M, or an equivalent device, whereby the cams are made to actuate the fly frames in a more direct manner, and consequently insuring a more perfect operation of the same than heretofore.

[This is described on another page.]

WASHING MACHINE—Abraham Huffer, of Hagerstown, Md.: I claim the combination of the shallow concave formed of rollers, D D, and feeding boards, E E, with the ribbed cylinder, A B, for the purpose of making the washing machine self-feeding and self-clearing, so as to pass the clothes alternately into the water and the air, thus bleaching, as well as cleansing them, and keeping the clothes in the upper strata of water away from the dirt, which is precipitated to the bottom of the tub.

PORTABLE FORGE—W. G. Hyndman, of Cincinnati, Ohio: I claim the plate, g g, when arranged with the bottom of the hearth plate, d d, by which arrangement of plates the recess, R R, is formed, and to be filled with fire-brick, or any other good non-conducting material, to serve as a hearth to the forge in place of laying the brick on the top of the hearth plate d d for reasons mentioned and purposes specified in the specification, and represented in the drawings.

CORN HUSKER—Charles N. Lewis, of Seneca Falls, N. Y.: I claim the combination of the operating lever, B, with the wedge pointed dog, D, lever, E, tripping post, H, blade, C, concave, G, and slot, K, the whole arranged and operating in the manner and for the purpose set forth.

PITCHERS FOR MOLASSES, &c.—Edward Mingay, of Boston, Mass.: I claim the means employed to prevent the dripping of liquids in pitchers for containing liquids, the same consisting of the movable spout or jaw actuated by the opening or closing of the cover, so as to raise and lower the said spout or jaw, substantially as set forth.

GAS METER INDICATOR—Thomas J. Pitt, of New York City: I claim the employment of a rotary indicator, constructed and operated substantially as described, and applied to gas meters to register the consumption of gas as set forth.

BUTTER WORKER—Isaac L. Smith, of Burlington, Vt., and Chas. C. Colburn, of Massena, N. Y.: We claim the box, m, hinged to a sliding frame, m′, and made capable of adjustment to any desired extent without being thrown out of gear, substantially as and for the purpose set forth.

[Full particulars of this invention will be found in another column.]

FASTENING FOR MACHINE BELTING—Lewis Smith, of Buffalo, N. Y.: I claim a series of curved arms, A, with faced end fingers, C, extending from a bar, B, on either side, and at right angles thereto, composed of one entire piece of metal, being a new article of manufacture, and constituting a belt clasp, to be used in joining the two ends of belts in running machinery, in the manner specified.

SELF-FEEDING DRILLS—William Wakeley, of Homer, N. Y.: I claim the arrangement of the gearing, J K F E′, as shown, whereby both pinions, E′ F, may be operated at the same time, so that the drill, E, may be rotated and fed to its work by the rotation of a single shaft or crank.

I also claim the arrangement of the lever, M, with the shaft, g, and catch, k, as shown, in connection with the rod, L, and cross head, c, with the pins, b b, attached, for the purpose of connecting the wheel, K, with the wheel, J, and disconnecting it therefrom, as described.

[See notice of this improvement on another page.]

BREECH-LOADING FIRE-ARMS—J. Durell Greene, of Cambridge, Mass.: I claim the groove, i, or its equivalent, operating in connection with the wad at the rear of the cartridge, in the manner substantially as set forth.

I do not claim a sliding breech plug, secured to the barrel by ears and shoulders, as such device does not constitute my present invention.

But I claim, second, The sliding breech plug, E, in combination with the revolving plunger, c, operating in the manner set forth.

Third, I claim the bolt, C, and stop, y, operating in the manner set forth, to interrupt the movement of the trigger, as described.

OPERATING PILOT'S BELLS ON STEAMERS—J. R. Hopkins, of Lincoln, Me., (assignor to himself and G. T. Sargent, of Bangor, Me.): I claim first, The arrangement of the knob, U, and slotted plate, B, substantially as shown, so that the several orders may be transmitted to the engineer, or the cylinder, I, rotated as desired, to present such orders, by moving one and the same knob in different directions.

Second, I claim the bars, o p q r n, levers, q′, provided with pins, u′, plates, L and o′, segment rack, K, pinions, C′, and rods, v, on the shaft, w, when the whole is arranged to operate as and for the purpose set forth.

Third, I claim the employment or use of the two levers, M M′, provided with bell hammers, N N, and operated by means of the bar, x′, attached to plate, L, and provided with springs, z′ z′, and the plate, P, the bar and plate being provided respectively with the projections or shoulders, y′ y′ f″ f″, and the whole arranged as shown and described.

[For information about this invention we refer to page 91.]

CAKE CUTTER—George R. Peckham, of Worcester, Mass.: I claim the movable cutter, F, with its head D, being placed in the socket, E, as represented, and its capability of being reversed in its position, as represented, for the purposes and uses specified.

ADJUSTING BAND SAWS TO CIRCULAR STOCKS—Jacob Vaughan, of Exchangeville, Pa.: I am aware that sliding carriages have been used for feeding bolts to saws, and bolts have also been dogged substantially in the same way as that shown; band saws, or their equivalents have also been previously used; but I am not aware that band saws have been secured to a rotating wheel in the manner shown and described.

I do not claim, therefore, the means employed for feeding the bolt to the saws.

Nor do I claim band saws, irrespective of the means employed for securing them to the wheel.

But I claim securing the saws, E′ G, to the wheel, C, by means of the expanding and contracting bands E H, whereby every part of the saws are firmly secured to said wheel, without perforating the saw or making use of intermediate bolts and screws, all as set forth.

[This improvement is described on another page.]

TOOTH BRUSHES—H. Nicholas Wadsworth, of Washington, D. C.: I claim a tooth brush having all the described features combined and arranged as and for the purpose set forth.

KEY FOR DOOR LOCKS—Thos. K. Webster, of Lawrence, Mass.: I claim the mode of making the key, that is, with its shank and bit in two parts, applied together, and combined with and containing lever bits p p, a cam k, slider, l, and spring, m, or the equivalents therefor, such lever bits while the key is being turned back in the lock, being made to actuate or force outward the latch levers, D D, applied to the bolt, and its case, and combined and operating therewith, as specified, the main bolt being constructed substantially as explained.

STEAM PRESSURE GAGES—John E. Wootton, of Philadelphia, Pa. I do not claim separately the elastic metallic disk as that in one form or another, has for some time been in use.

But I claim the combined arrangement of the duplicate elastic metallic disks, B C, with the bars, G H, as described, for the purpose of giving motion to the index O, in the manner and for the purpose described.

MACHINE FOR FACILITATING THE HUSKING OF CORN.—George Young, Jr., of Saratoga Springs, N. Y.: I claim the combination of the respective actuating parts thereof as above described, whereby the latch, i, the knife, s, and the hammer, g, will act in conjunction with each other, in the manner and for the purpose set forth.

HEMP BRAKES—G. F. S. Zimmerman and Armstrong Beattie, of St. Joseph, Mo.: We do not claim, separately or in itself considered, either of the parts shown and described.

Nor do we claim the broad idea of operating upon both sides of the hemp simultaneously, for this is seen in the device of F. P. Holcomb, patented March 13, 1847, where the hemp is carried in between a pair of rollers, the teeth of which mesh together.

But we claim the arrangement and operation of the rollers, C C, scutching rollers, D D, and breaking cylinder, B, as set forth, whereby the hemp is stretched between the feed rollers and breaking cylinder, and also between the latter and the scutching rollers, the material while thus stretched being acted upon by the breaking cylinder, B, and the scutching rollers, D D, all as described.

[This improvement will be found described in another column.]

CORN HUSKER—H. A. Doster, of Bethlehem, Pa., (assignor to himself and Smith A. Skinner, of Lowell, Mass.): I do not claim the employment or use of rollers for husking corn, irrespective of the arrangement of the teeth and grooves as shown, for rollers have been previously used for the same purpose.

But I claim the rollers, B C, when provided with the grooves, d, and teeth, e, arranged substantially as and for the purpose set forth.

[For more information about the above we refer to a notice on another page.]

CUTTING APPARATUS FOR HARVESTERS—J. L. Fountain, (assignor to himself, L. J. Clark, Bradford McKinney, and C. M. Fountain,) of Rockford, Ill.: I do not wish to be understood as claiming broadly either the combination of an inclined cutting edge with a straight edge on the finger, the cavities, c c, or the clearing pins a′ a′.

But I claim the fingers, C, when constructed in the peculiar manner above described, in combination with the horns or projections, G, reciprocating sectional cutters, D, and clearing rivets, a′ a′, the whole constructed and arranged for joint operation in the manner and for the purpose set forth.

VENTILATING ATTACHMENT TO BE APPLIED TO PUMPS—C. N. Lewis (assignor to himself and G. C. King) of Seneca Falls, N. Y.: I do not claim broadly the ventilation of wells, by means of air tubes leading from the surface of the ground to the interior of the well, for I am aware that it is old. An example may be seen in the patent of D. Bartlett, 1856.

But to the best of my knowledge and belief it is a new combination to unite a perforated ventilating chamber and base with the pump barrel in such a manner that the ventilator shall constitute a part of the pump; whereby when the pump is applied, the ventilator is also applied and becomes operative from the moment the pump is set.

I claim the arrangement and combination of the perforated base, D, cap G, and perforated tube, g, with the pump barrel, A, as set forth, whereby the ventilator becomes attached to and forms a part of the pump, all as specified.

[By this arrangement the well is perfectly ventilated, and rain water, dirt and foreign substances are prevented from passing down the ventilating channels.]

MACHINE FOR TURNING PILLARS FOR CLOCK MOVEMENTS—W. H. Nettleton Chas. Raymond, and Anson Hatch, (assignors to W. H. Nettleton) of Bristol, Conn.: We do not claim the use of two chucks, simultaneously brought up to turn the ends of a wire to form a pillar shaft or arbor, as the same has been in use and on sale for many years.

Neither do we claim any particular device for holding the turning tools into the chucks; neither do we claim any sliding mandrel or mandrel head, as these are well known for other purposes; neither do we claim the straightener, b, as the same is well known.

But we claim the feeding slide, h, in combination with the straightener, b, having an endwise movement and returning spring or its equivalent substantially as specified, whereby the straightener is drawn along as the wire is fed forward, and straightens the wire as it is forced back by the said spring or its equivalent as specified.

We also claim the compound levers, i and 19, made and acting in connection with the feeding slide, h, and clamp, 14, as and for the purposes specified.

We also claim the holding jaws, k and 26, regulated in their action by the screws, 28 and 29, and operating as and for the purposes specified.

We also claim the sliding gage, m, actuated by the cam, 22, in combination with the holding jaw, k, as specified, whereby the gage, m, is withdrawn, while the pillar or arbor is being forced out of said holding jaws, but comes up to determine the length or position of the wire or blank that passes into said jaws as set forth.

CORN HUSKER—S. A. Skinner, of Lawrence, Mass., (assignor to himself and Herman A. Doster, of Bethlehem, Pa.): I am aware that my machine contains some mechanical devices incident to other machines for husking corn—that is, it contains a serrated cutter, and a means of stripping the husk from the ear; I therefore do not claim the employment of a saw or cutter in connection with an endless carrier to hold the ear of corn, and so present it to the said saw, as to enable the latter to separate the stalk and husks from the ear.

Nor do I claim the employment of an inclined grated spout or gird, and a toothed cylinder having its teeth operating through the spaces between the bars of the spout, and so as to seize the husks, and separate them from the ear, while the latter, by the action of gravity, passes down the spout.

I am also aware that for separating the husk from the ear of corn, two rollers have been employed, each of which has been constructed with teeth and grooves arranged circumferentially on it, and so that the teeth of one roller worked into the grooves of the other while the teeth of the latter work into the grooves of the former. In this case, however, the ear of corn being seized on opposite sides by the teeth of both rollers, could not easily revolve so as to be entirely stripped of its husk, the conjoint operation of the teeth of the two rollers operating also to cause the teeth to penetrate the husks, and tear the kernels of corn out of the ears.

I therefore do not claim fluted or corrugated rollers for husking corn, nor the employment and use of rollers irrespective of my improved arrangement of teeth and grooves; nor do I claim making each roller with teeth and grooves.

But I claim the arrangement of the teeth in one roller in combination with the arrangement of the grooves entirely in the other roller, the same serving to effect the rotation of the ear of corn, as well as the removal of the husk and its presentation to the bite of the rollers as specified.

STEERING APPARATUS—T. M. Richardson (assignor to himself and J. W. Havner) of Searsport, Me.: I do not claim the slotted tiller, as that was patented Nov. 28, 1842, by P. T. Share; nor do I claim any of the parts separately considered.

But I claim the described combination and arrangement of the rope or chain, M, with the stationary grooved sheaves, L L, and the grooved pulley, E.

STREET SWEEPING MACHINES—David Shattuck assignor to himself, J. S. Shattuck, Jacob Morrill and W. P. Marshall) of Boston, Mass.: I claim the above described arrangement of the cam, R, beneath the horizontal arms or brush carriers, N, whereby the dirt may be thrown to either side, or to the center of the street, as set forth.

MACHINE FOR TURNING WOODEN BOXES—A. S. Newton, of Brandon, Vt.: I claim, first, The use of the combination of the grooved rod and level wheel on the end thereof, with the wheel Q, and cam, T, substantially as set forth

Second, I also claim the use and combination of the grooved rod, and bevel wheel on the end thereof, with the wheel, R, and cams, X and Y, substantially as set forth.

Third, I also claim the use and combination of the cam, X, with the lever, Z, cutter lever, b 2, and discharging bar, f 2, or their equivalents, separately or collectively, for the purposes set forth.

Fourth, I also claim the cam, Y, in combination with the lever, K 2, and rack, r 2, or equivalents for the said parts, substantially as set forth.

CALENDER CLOCKS—Wm. H. Akins, of Berkshire, N. Y., and Joseph C. Burritt, of Ithaca, N. Y., (assignors to W. F. Huntington and Hervey Platts, of Ithaca, N. Y.): I claim the quadrennially revolving corrugated disk, I, when operating in the manner substantially as and for the purposes set forth.

RE-ISSUE.

CARDING MACHINES—H. N. Gambrill and Singleton F. Burgee, of Woodbury Mills, Md. Patent dated Feb. 27, 1855—Ante-dated Aug. 22, 1854: We claim the application of two or more sets or pairs of feeding rollers to the working cylinder of carding engines substantially in the manner and for the purpose set forth, and this we claim whether said feed rollers deliver the material directly on to the main cylinder or to lickers-in, when said lickers-in are so arranged as to work in connection with each other, and with the main cylinder, for the purpose and in the manner substantially as set forth.

We also claim the reversing of the relative velocities of the peripheries of the main working cylinder and stripper, M, at intervals by an automatic movement for the purpose of cleaning or preventing the clogging of the main cylinder, substantially as described.

DESIGN.

MATCH BOXES—Elisha Waters, of Troy, N. Y.

Boiler Explosion.

A boiler explosion occurred in a brass foundry at Bridgeport, Ct., on the 12th inst., the force of which nearly demolished the whole building.

We learn from the *Farmer* that the catastrophe does not appear to have been the result of carelessness on the part of the engineer, as there were no indications of a want of water, or of any undue heat in the flues, but that in the opinion of practical men it was owing to the want of sufficient strength in the head of the boiler, which was made of cast iron, four feet in diameter, without any braces or stays for its support; it had been in use only about eight months. We cannot deprecate in too strong language the use of cast iron for heads of boilers, because it is a material totally unfitted for this purpose, owing to its friable character. Some years since, cast iron boiler heads were not uncommon in western-made boilers, and numberless were the accidents or explosions caused by its use. It dare not be used now on any boiler subject, by law, to government inspection, and should not be allowed to be employed in any boiler whatever.

The Orders of Architecture.

The word "order," in architecture, has reference to the form of column and roof used by the Greeks and Romans. There are five great classes, the Doric, Grecian, Ionic, Corinthian and Composite. During the past few centuries there has been little originality in this branch of art, each designer prefering to follow after the known systems and only introduce new combinations; and in ages yet to come we shall not, like our ancestors, have a distinct and definite system of architecture by which to be distinguished. As iron is now entering so largely into our buildings, surely some new style ought to be adopted, as it is self-evident that that style which was easy, harmonious and graceful when built up of stone will not be the same when moulded in iron. Our architects should look to this, and see that, if iron is to characterize this age as a building material, it should carry with it its distinctive style of art.

Turmeric.

This is a fine yellow powder soluble in water, and is the ground root of a walnut, the Indian Saffron. It is brought chiefly from the East Indies and China, but will grow in almost any moderately warm climate. It gives a fine yellow to stuffs dyed in it, and paper colored with it turns brown by the action of alkalies, and is a very delicate test for their presence. It is also used in curry powder and is a powerful diuretic. A plaster of turmeric top and roots well bruised is a good remedy for the bite of a rattlesnake.

AN INVENTOR DEAD.—Oliver B. Judd died suddenly at Little Falls, N. Y., on the 31st of October. He was a patentee, and also an inventor of several useful improvements. We regard the death of one such contributor to mechanical progress as a much greater loss to the community than that of many warriors famed in history.

[For the Scientific American.]

The Distribution of Heat.

The early portion of last summer was remarkably cold while the autumn has been quite mild. It is generally the case, that unusual coldness or heat in one portion of a season is compensated for at another period. There has never, within our recollection, been but one summer in which the general temperature throughout exhibited a marked difference from that ordinarily experienced. This was in 1836, and was probably caused by the large spots on the sun which were visible to the naked eye. These large dark spots would seem to have detracted temporarily from the heating power of the sun. Heat is continually radiated from the earth into space, and as continually received from the sun. In case the supply be in the least diminished, the radiation lowers the temperature. It was a great omission in Byron's terrific dream of darkness, not to allude to the marked degree of cold which would follow from the total absence of the sun, even for a single day.

Although the solar rays have an immensely preponderating influence over all other causes in controlling the terrestial heat, there are influences somewhat mysterious which affect the subject. If we trace on the map of our country the lines of equal temperature, they will differ very widely from the parallels of latitude. The mild winter temperature of North Carolina, for example, is imitated by Texas which is some three degrees further south, and by Washington Territory which is seven degrees further north. The winters of Delaware are similar to those of central Indiana, one degree further north, those of Missouri and southern Kansas, a trifle further south, and those on Puget's Sound in the extreme north of Oregon, a locality nearer the North Pole than freezing Quebec.

There are local causes due to the influence of prevailing wind, etc., which greatly affect the temperature of a country. The warmth on the Pacific coast is due to warm ocean currents, and the temperature of the British Islands, France and Spain, is materially affected by this influence, in consequence of the Gulf Stream, which, commencing in a warm latitude, flows across the ocean, avoiding our coast, and impinging directly on the shores of Europe.

There is supposed to be an influence due to the lines of magnetic variation, though it may reasonably be doubted whether the variations in magnetic influences should not be considered as the effect of the differences in heat.

Bones of elephants, and of the tropical animals, have been found among the icebergs of Greenland, and although this might be explained by supposing the temperature of the whole earth to have been once greater than at present, in consequence of internal heat possessed at creation, and that the polar regions first became habitable only for animals adapted to a very warm climate, the question is rendered extremely complex by the discovery in soft and balmy Italy of remains positively known to be those of animals now inhabiting only the mountains of Siberia. But we are no believers in the igneous theory, and consequently ascribe this to the precession of the Equinoxes, which causes a gradual change in the position of the magnetic meridian. It is difficult to explain these phenomena by a supposition that the character and habits of the animal races have changed, and we must believe that the temperature of various localities has undergone, at various times, immensely great changes, and that such may be now gradually progressing. The climate of New England is thought by many to be much milder than in the days of our forefathers, although we are of the opinion that the records which have been kept of its temperature do not show such changes to be at all important, but there are traditions of a much warmer climate, being once enjoyed by the whole of our northern continent. The subject is certainly one of great interest.

T. D. S.

Water Heated by Friction.

Messrs. Editors—In your issue of the 31st ult., you briefly allude to a paper by George Rennie, of London, on this interesting subject. During the exhibition at the New York Crystal Palace in 1853, I had many opportunities to notice the effect of friction on the temperature of water. You and many of your readers will remember among the pumps then on exhibition two of "Gwynn's Centrifugal Pumps;" one the large fountain pump, in the east nave, with a capacity for elevating 7,000 gallons of water per minute; and the other, a smaller one in the machine arcade, with a capacity of about 300 gallons per minute. Both these pumps were arranged to work the same water over till it was best to change it, and in both the effect in raising the temperature was very apparent. The suction pipe of the small pump was four inches in diameter, while the discharge was but $2\frac{1}{2}$ inches, and yet at an elevation of but five or six feet, 400 gallons per minute or 26,000 gallons per hour were constantly driven through this small orifice when the pump was in motion. This motion in an atmosphere not higher than 40 or 50 degrees would in a few hours bring the water to blood heat, and in the summer weather, if I may judge by comparison and my own feelings, I have frequently noticed the temperature of water so heated as high as 150°.

The larger pump was erected with a view to the "Delights of a Gushing Fountain," and the cooling effect of water in motion, and when a fresh supply was introduced from the Croton, we in a measure realized our hopes; but, after a short agitation, the glow was changed by a scattering damp that made it impracticable to keep it long in motion.

The laborious duties of my position prevented me from noting for publication at the time this, as well as many other interesting phenomena, which should more attract the investigation of philosophic minds. I am glad such men as George Rennie have directed their especial attention to this matter, and I hope we shall learn the true cause and source of the heat evolved.

My own opinion has been that the sensible heat apparent is more the result of the sudden compression of the particles or *bubbles* of air constantly carried into the water, and by its force possibly reduced momentarily to one-half or even one-fourth of its natural bulk, thus for the moment having its heat doubled or quadrupled above the temperature of the water, and, of course, giving off a portion to the water surrounding it. The air bubbles do not fully regain their natural size or bulk till they are liberated from the water and do not carry out as much heat as they carried in, and to this I attribute the cooling and grateful effects of "babbling brooks" and the "rushing waterfall," so long as the supply comes fresh from the fountain.

Please let us have more of your own philosophy on this subject, and induce some one who has leisure to try further experiments by keeping the surrounding atmosphere within one or two degrees of the increased temperature of the water, and also to try the agitation in a vacuum, and let us know whether pure water can be heated by friction.

Joseph E. Holmes.

Newark, Ohio, Nov., 1857.

[The opinion hitherto in vogue among philosophers is opposed to an increased heat being produced in liquids by their own friction, and also to an increased heat being produced by the friction of a current of air or gas upon a liquid or solid. It is well known that water coutains a portion of atmospheric air, and by compressing it, heat will be changed from low to high intensity. As the discharge pipe of the pump to which Mr. Holmes alludes was much smaller than the suction, the air in the water must have been compressed, as he suggests, thus developing increased sensible heat, a part of which was left in the water, even when the air escaped, because the water has nearly five times a greater capacity for heat than air, and therefore parts with its caloric more slowly. Probably the heat generated by the friction of the solid parts of the pump was also communicated to the water, and tended to elevate its temperature. Count Rumford, by boring a cylinder of cast iron, raised the temperature of several pounds of water to the boiling point.

New Fire-Engine Trial.

Messrs. Editors—As many of your readers are interested in fire-engine matters, I send you an account of the performance of a new engine in this place. It was built for Ocean Engine Co., No. 3, by William Jeffers, Pawtucket, R. I. This engine has 10-inch cylinders, and 10-inch stroke. After the parade on the 7th inst. she was tried, with the following result:—Drawing her own water, and playing through 400 feet of hose, she threw a good solid stream 184 feet perpendicularly. This, for a new engine, manned by a new company, (many of them never having been on the brakes before), certainly speaks well for it. E. A. H.

Springfield, Mass., November, 1857.

[This certainly was a good performance, as 130 feet perpendicular hight, out of 100 feet of hose, is held to be excellent playing.—Eds.

Preventing Cars from Running off Railroad Tracks.

Where the road forms a curve of 2000 feet diameter, the difference between the length of the outer and the inner track is equal to 5 feet for every 1000 feet of road when the gauge is 4 feet, and nearly 6 feet to the 1000 for a 6 foot gauge. This difference causes the inner wheel to drag on the rail, thereby increasing the resistance and wearing out the tire.

If, by this cause, one of the wheels gets worn out more than the other, its diameter will be smaller and the motion of the car in a straight line will become dangerous from the same cause; the larger wheel causes the smaller one to drag.

If one of the wheels drags, the sliding friction produced thereby gives a tendency to the car to place itself crossways on the track. It is dangerous therefore to run at great speed even on a curve of 3000 feet diameter, and as this makes it necessary in building a railroad to avoid curves as much as possible, a road through a rugged or uneven country is very expensive. The axles have to be made unnecessarily strong as they have to sustain a twist from the same cause. An Austrian civil engineer undertook to avoid this difficulty by putting the wheels on a separate axle each and uniting the two halves by different means; none of them, however, seems to us perfect enough to deserve recommendation, and we expect our inventors will come to the rescue and will find out some cheap and simple plan to give each of the wheels an independent motion from the other, still making the whole strong enough and safe against accidents.—*Journal of the Society of Austrian Civil Engineers.*

How Coal is Sold in London.

The coal used in the city and neighborhood of London is chiefly brought from the northern coal district of England by large iron propeller colliers. From them it is unloaded on to a wharf, where it is screened or sifted by being thrown on an inclined riddle, the size of the lumps having some influence on the price, which is generally from $5 to $10 per tun, according to quality. It is then put in sacks, containing one hundred weight, or sometimes two each. These are loaded on large carts drawn by enormous horses, with scales and weights to each cart, and, if desired by the purchaser, the sack is weighed by the driver. When the honesty of the coal merchant and the integrity of the driver is well established, the weighing of the sack is seldom required. And in the purchase of a cartload of sacks, some three or four of them, taken promiscuously, are tested by the scales, and if found correct, the weighing of the remainder of the load is dispensed with. This mode of buying and selling coal is the result of many years' experience in the vast city of London.

Signal Apparatus.

This apparatus is intended for communication between the pilot-house of a ship and the engine-room, or other place. It is so constructed that by pulling a knob in the pilot-house a cylinder is rotated in the engine-room, on which cylinder is painted the desired signal, at the same time calling attention by a bell. There are also two bell hammers, which are arranged in such a way that the striking of them ensures the rotation of the cylinder to the desired signal. It is the invention of J. R. Hopkins, of Lincoln, Me., and was patented this week.

Lime Kiln.

This invention ensures a rapid, yet regular and uniform burning of the lime, and avoids a blowing of the draft entirely across the kiln, or through one furnace door and out at another. It likewise exposes a greater surface to be acted upon by the fire, which, by this arrangement, is brought in direct and positive contact with the whole mass throughout at the same moment, and thus the difficulty from the outer portion being subjected to a much greater heat than the central portion, is entirely overcome. It is the invention of P. Griscom and C. S. Dean, Baltimore, Md.

Hemp Cutter.

This improvement effects the delivery of the hemp after it is cut, in such condition and in such relation to the team and the body of the machine, that it shall not be trampled upon by the horses, or disturbed by the machine. To accomplish this result, a reel with spirally twisted blades, two inclined directing boards, and two hinged trailing platforms are employed. The reel bends down the hemp stalks, the inclined boards direct them upon the platforms, and the platforms deliver them in a collected state into a central space existing between the platforms. It is the invention of J. L. Hardeman, of Arrow Rock, Mo.

Drilling Machine.

William Wakely, of Homer, N. Y., has patented an improved drill, the principal feature of which is that the driving movement of the drill is connected in such a way with the feed movement that both may be operated simultaneously when desired, by the turning of a single crank, and the feed also operated singly or alone, when necessary, so that the drill or arbor may be moved forward or backward with irregular speed, to any desired point.

Sawing Felloes.

This invention consists in having two band saws attached, one to the outer and the other to the inner periphery of the wheel, the saws being attached to the rim by means of bands or straps, and the outer saw expanded or contracted by interposing bands between the saw and the periphery of the wheel; the whole being arranged so that the felloes may be sawed with facility and the depth or thickness varied as occasion may require. It is the invention of Jacob Vaughan, of Exchangeville, Pa.

Printing Presses.

Richard M. Hoe, of this city, has patented another improvement in printing presses. This has relation to the operation of the fly frames, which are usually made to move by means of a cam and complicated arrangement of levers, connecting rods and bell cranks. The improvement consists in having a cam shaft at each end of the machine, and operating the fly frame immediately from it, making it much more simple in its action.

Corn Husker.

This improved corn husker consists in two cylinders grooved around their circumferences, and armed with teeth, so that they meet at such an angle as to draw away the husk, and throw the corn into a receptacle beneath. It is the invention of H. A. Doster, of Bethlehem, Pa., and was patented this week.

Hemp Brake.

G. F. S. Zimmerman and A. Beattie, of St. Joseph, Mo., have patented a new and improved hemp brake, in which the brake cylinders and feed rollers are so arranged that they separate the broken part from the filament or fiber in a perfect and expeditious manner.

New Inventions.

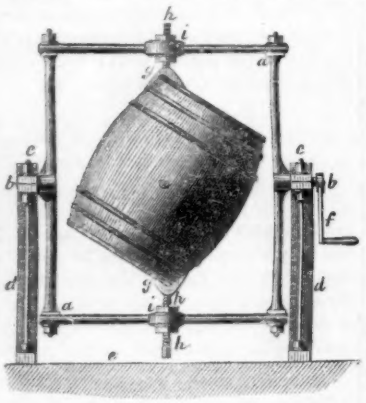
Improved Diving Bell.

Mr. Maillefert, of this city, has invented an improved diving bell which he calls an ærostatic tubular one; it is composed of an ordinary bell having in addition an outer case which can be filled with air to raise it, and a long tube from the bell, having ladders inside and shutters so arranged that the workmen can ascend and descend without the necessity of bringing up the bell each time, as the tube projects above the surface of the water. An experiment was tried with it at Hunter's Point, L. I., in eighteen feet depth. As soon as the bell had been lowered, the men descended by the tube and remained in it five hours; they then ascended for dinner, and afterwards went down again and remained another five hours, working all the time on the submarine railroad track. They could hear distinctly all that was said on shore 150 feet distant, and were much satisfied with the experiment. Sufficient light passes down the tube to enable them to see how to work.

Machine for Cleaning Casks.

We copy this engraving from the London *Engineer*, as it appears to us to be an ingenious and useful little device. It consists in an arrangement for holding casks while being caused to rotate for rinsing and scouring the interior of the cask.

The illustration represents a front view of a cask-cleaning machine with a cask mounted in it. *a*, *a*, is a strong rectangular frame of iron, furnished with journals, *b*, *b*, one on each



side, which are fitted in suitable bearings, *c c*, carried by A-shaped standards, *d d*, which are erected and rigidly fixed on the base or floor, *e*. The axis of the frame is represented as furnished with a winch handle, *f*, for the purpose of rotating the frame *a* by hand, but it may be driven by a strap and rigger or other suitable contrivance for communicating steam or other motive power. *g g* are the fangs or parts for fixing the cask in the frame. The V-holding prongs or fangs, *g g*, are formed to suit the chime or angle of the cask to be held; the stem, *h*, of each of these fangs, *g g*, is furnished with a screw thread fitted with nuts, *i i*. The stems, *h h*, are passed through plain holes in the frame, and are fixed in position by the set nuts, *i i*. The nuts, *i i*, afford the necessary facilities for forcing up and fixing the cask by the fangs, *g g*, and also permit of the fangs being adjusted to suit different sizes of casks. The position of the cask may also be varied at will by turning the cask round on the stems, *h h*, as on an axis; this may be done from time to time as the work progresses, if necessary, the machine being stopped for the purpose. In order to effect this, the nuts, *i i*, are slacked on the stems, *h h*, which being furnished with squares for applying suitable keys or wrenches, the stems and the cask with them are partially turned round.

The mode of operation is as follows:—The cask having been mounted and fixed in the frame by the fangs, *g g*, the bung is turned uppermost, and water or other fluid, with or without solid materials, introduced into the cask; the bunghole is then closed, and the frame, *a a*, with the cask, put in motion by the winch handle, *f*; the frame, *a*, being turned end over end, gives the necessary motion to the cask, and thereby agitates the contents in such a manner as to effectually scour and cleanse the interior of the cask so submitted to its action. The contents of the cask are then run out at the bunghole, and fresh water put in if necessary and the motion repeated, in order to rinse the cask, which is then removed from the frame. A modification of the above apparatus is described in the patentee's specification. It consists of an arrangement for holding the cask in a position in line with the axis of rotation of the frame. The apparatus is worked in the same manner as that above described.

MESSENGER AND REHAHN'S BARREL COOLER.

Fig. 1

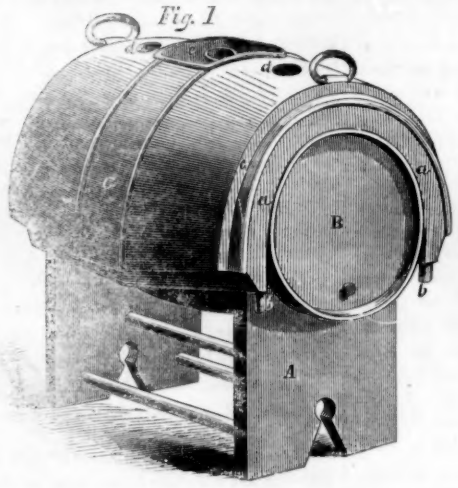
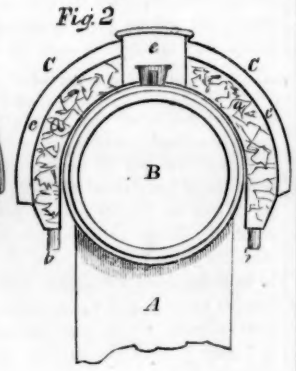


Fig. 2



All those light kinds of beer, and other liquids, which cannot be drawn through an engine, while the barrel remains in the coolness of the cellar, but must be at hand that the fresh glasses may be drawn from the wood itself, are certain to get very warm in summer, and there is nothing so thoroughly nasty as warm "lager." By the use of this cooler it is always kept sparkling, fresh and clear.

This invention is intended to be a portable refrigerator for barrels, and it can be easily lifted from one to the other. In our engravings, Fig. 1 is a perspective view of one fitted on a barrel, and Fig. 2, a section.

A is the stand, and B the barrel, C being the refrigerator made of zinc or similar metal. It is divided into two compartments, in the one, *a*, is placed the ice, at the end of which are two channels, *b*, through which the water can run off; *c* is the other compartment, in which is placed plaster of Paris or some non-conducting substance, and has two holes, *d*, through which it can be filled. There is also a cut-off arrangement seen at *e*, keeping the space over the bung free, so that the bung can be easily pulled out to allow the liquor to run. It was patented Sept. 15th, 1857, and further particulars may be obtained by addressing the agent, A. Lippman, 96 Eldridge street, New York.

Andrus' Feed for Sewing Machines.

All those kinds of feed motion (applied to sewing machines) which consist in the motion of an independent foot or feed pad, are apt to be irregular in their action. The inventor of the arrangement illustrated by the accompanying engraving has devised a plan to obviate this difficulty.

A is the end through which the needle shaft moves up and down, having projecting from

Fig. 1

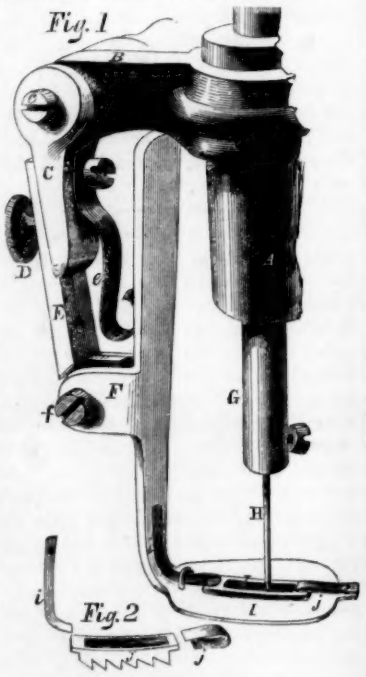


Fig. 2

it a piece, B, to which is hinged the piece, C, by the screw, *c*. The screw, D, fastens E, and to it is hinged by the screw, *f*, the foot, F; this is kept on the cloth by the pressure of the spring, *e*. This foot has an independent motion communicated to it from the driving wheel through the parts we have described; it is serrated on its lower side to grip the cloth. I is the portion that lays on the cloth, and through it is inserted the supplementary foot, J, (seen separate in Fig. 2), which is kept in place by the springs, *j* and *i*, and by their means it is always able to maintain a hold on the cloth, and ensure the regularity of the feed motion. The needle, H, attached to the piece, G, passes through this supplementary foot, which has in it a slot, to allow the same. It is especially applicable to the cheap machines, and was patented November 3, 1857.

Further information may be obtained from C. H. Andrus, Collins' Hotel, New York.

Improved Method of Treating Iron Ores.

An improved method of freeing iron stone and other metallic ores from shale has recently been invented by John Harding, of Leeds, England. In preparing some iron ores for the furnace, it has to be separated from the shale, in which it is found imbedded. This has hitherto been performed by spreading the ore upon the surface of the ground, and subjecting it to the action of the weather until the shale is sufficiently loosened to allow of its being chipped off the ore by manual labor. This is a work of months and years, and is a costly process, in consequence of the number of men necessarily employed in spreading, chipping, &c. The improvement consists in subjecting the ore shales to the action of steam, and accomplishes in a few hours results which require months of exposure to the weather to otherwise obtain, and are then very often imperfectly accomplished.

Drying Wood.—One of the cheapest and most effectual methods of drying wood is to expose it in a closed chamber to steam heated to about 400° or 500° Fah., which will extract all the moisture.

Getting Better.

After seeing all around us hungry human beings asking for work, and feeling that the difficulties in money matters had caused a temporary stagnation of manufacturing industry, it is with pleasure that we learn from various quarters that water wheels and steam engines are again working, and the noise of mill gearing again animates the lately silent centers of productive wealth. In our own city, many workshops are daily taking on the hands which they were compelled to discharge during their temporary suspension. In Lowell, Mass., two large mills, that have been working only half time, are about to resume their usual amount of labor; at Woonsocket, R. I., a large rolling and nail mill has set to work; at Norwalk, Conn., mills on whose working or stoppage depends the daily bread of thousands, are now in motion; and at Manayunk, Pa., and its neighborhood, many factories have opened their doors, and the pleasant click of the shuttle and rattle of the spinning bobbin is once more heard in the picturesque valley of the Schuylkill. Four mills and two calico printworks at Fall River, Mass., the Chicopee (Mass.) mills, and the Troy and Albany Iron works, N. Y., have also resumed operations.

It would seem that we were not crushed by the past panic, but only knocked back a bit; and if it did burn us a little, we shall rise, Phœnix-like, more glorious, from the ashes, and be more strong and energetic for the temporary disaster.

Arrival of the Frigate Niagara.

This noble war steamer arrived at this port on the 20th, having sailed from Plymouth, Eng., on the 5th inst., making the voyage in a little over fourteen days—a very good passage for a propeller across the Atlantic at this season of the year. There are some recollections of a regretful character connected with the arrival of this vessel. She left our shores last spring to assist in laying the ocean telegraph cable; and great expectations were entertained, from the extensive preparations made, that this would be successfully accomplished; but these hopes all proved delusive. On the 10th of August, the cable was broken by mismanagement, and the expedition defeated in its objects. The vast expenses incurred by our own and the British governments have all been thrown away, and the *Niagara* has returned home, having failed to accomplish the objects for which she was sent to Europe. It is now reported that even if the cable had been laid, it would not have operated, as its coating had heated and become defective in the holds of the vessels in which it was coiled.

The officers of the *Niagara* met with much attention, and received tokens of great kindness from the people while in England. A splendid farewell banquet was given to them on the British flag-ship *Impregnable*, at Plymouth, a few days before the *Niagara* sailed for home.

The Commissioner's Decision on the Policeman's Club.

An application was recently made for a patent on an improvement to render policemens' batons or clubs more efficient, and prevent those using them from being disarmed by rioters. This application has been rejected by the Commissioner, and a partial report of his decision was telegraphed to and published in our city papers of Friday, last week. The decision came too late for us to present our views on the subject in this number, but we will do so in our next. We will only state at present that the report has been the means of propagating through the daily press the most ridiculous and erroneous notions respecting this invention.

Steamship Vanderbilt.

This well-tried and famous vessel came near meeting with a serious misfortune on her late voyage to Europe. She grounded on a shoal off Southampton; but, fortunately, a tug steamer was alongside, and pulled her off, with only the loss of an anchor, she having sustained no damage to her hull.

Scientific American.

NEW YORK, NOVEMBER 28, 1857.

American Cotton and its Present Interests.

There is no material which affects so many manufacturing interests as that which forms the subject of this article. It has now arisen to be the most important of all fibrous substances employed in the arts; and it is not a little surprising that it has attained to this position within a very recent period. Our country is the chief source of its supply, furnishing as it does about eighty per cent of the whole product. Millions of anxious minds are, therefore, continually directed to the source of its cultivation, because an abundant or deficient crop, by raising or lowering its price, either gives them plentiful labor and the means of comfortable subsistence, or stops the wheels of industry, and makes them go idle in the streets, suppliants for work or bread.

In 1641, cotton was first spun in England, on the common hand wheel, but was only employed mixed with wool in cloth; and small, indeed, was the quantity used, even for this purpose. From 1700 to 1760, the only persons who used it were weavers, who wove it into cloth during the day, their wives and children having spun it in the evenings and leisure hours. It was then a dear material—although much cheaper than fine flax—owing to the difficulty of separating the cotton from its seed, this having been done either by hand picking or by passing it between rotating rollers. Notwithstanding this, however, its use increased, and the demand for it soon exceeded the supply. The invention of the cotton gin gave a wonderful impetus to its culture; and the inventions of the spinning jenny, mule spinner, and power looms, whereby, from the field to woven fabric, it could be operated by machinery, at last raised it to the pinnacle of manufacturing fibrous materials. In England, in 1757, only 4,765,000 lbs. were consumed; in 1856, no less than 1,023,000,000 lbs. were imported into that country. Previous to the present financial difficulties, the demand for it far exceeded the supply, and would do so now, were these difficulties removed. Before the Sepoy mutiny took place, large meetings of cotton manufacturers were held in England, for the purpose of influencing government to offer greater encouragement to its cultivation in the East Indies and other colonies, because they felt they were entirely dependent on our Southern States, and were becoming more so every year.

For the last thirty years its consumption has doubled every twelve years; and at the end of 1856 there was only seven weeks' supply of it in all Great Britain. In its manufacture 379,213 British operatives were engaged, whose yearly earnings exceed $50,000,000, and the capital invested in machinery and buildings exceeds $200,000,000. Two months ago, owing to the increased demand for cotton, its price had arisen to double what it was ten years since, and many of our cotton manufacturers, as well as those of other countries, had to suspend operations, because the manufactured cloth could only be sold for about the price of the raw material, weight for weight. At present, most of the cotton factories in England are working only on half time, and those of our own country even less than this. Our financial difficulties, no doubt, aggravate this evil, but they are not its sole cause; it is the high price of cotton. Since so many persons are dependent on cotton manufacturing, it is an important question whether its supply can be increased in proportion to the demand for it, and its price lowered to meet that demand.

It appears to us that after the present financial crisis is over, the price of cotton fabrics must advance considerably, and this will call those factories which are now idle into active operation. The price of cotton cannot come down to the low figure at which it ranged ten years ago; and our Southern States will maintain the monopoly of its supply to the world for many years to come, at least, if not for ever. The East Indies was the first field to which the British cotton manufacturers were looking for a future cheap supply, to place them independent of our planters; but the late mutiny of the Bengal army and the insurrectionary state of that country have put East India cotton entirely out of the question. Our cotton crop last year amounted, in value, to $130,000,000; this year, the calculation is that it will amount to $160,000,000. Its value is increasing rapidly every year. It is one of the chief sources of our national wealth; and upon our yearly crop the whole cotton manufacturing world is, at present, depending.

Fuels, Mineral and Vegetable.

The process of combustion is but an oxydation of the substance being burnt, and the heat evolved is the result of this chemical combination. Any material that is capable of oxydation may be used as a fuel; but as an economical question, we can only usefully employ those which contain a great quantity of heat-making matter in a small space, so we have adopted carbon and its compounds as our every-day warmth-givers. These compounds of carbon form a wonderful series of bodies—sparkling in the diamond, glistening in graphite, shining in anthracite, transparent as air in carbonic acid, and a fine black powder in soot. The most really economical, in point of heat, is charcoal, which is nearly pure carbon, and is capable of giving out a most powerful heat; it is prepared by heating wood in close vessels, when all the gases, resins and tars distil over, and pure charcoal remains behind. It should retain perfectly the shape and run of the fibers of the wood, and should be hard, compact and rather brittle, to be good. In wood there is generally from 24 to 26 per cent of pure charcoal. On the average, a given weight of charcoal will give out more heat than the same weight of any other fuel, with the exception of two varieties of soft coal from South Wales. Next in order comes anthracite, which is the oldest of all kinds of fossil fuel. Its structure is perfectly homogenous, or precisely the same throughout the mass; it breaks with a shell-like fracture, has a jet black color, and a glassy luster, on which is often seen a beautiful play of colors. Of this there is plenty in the world, only requiring to be raised. Pennsylvania alone has sufficient to supply us for an definite period; and in this country it is, practically, the best fuel that can be obtained. The average of American anthracite contains about 90 per cent of carbon, while that of France (of which however, there is very little) contains 94 per cent of the same.

After anthracite is coke, which is, so to speak, coal charcoal. When brown or soft coal is heated in close vessels or in heaps, to which very little or no air has access, the tar and gases are driven off, and coke remains. The gases are now generally collected, and with them we light our houses and streets, and the tar serves many a useful purpose.

Good coke should possess sufficient solidity to bear the weight of a smelting furnace without crushing, as smelting is one of its principal uses. It ought to be hard and coal-like in form, and should have no soft, damp, black dust on its surface, and must not be exposed too long to the action of the atmosphere and weather, or it will soon perish, and become valueless. It is sometimes made by the coal being carbonized in heaps, other times in brick mound-shaped fireplaces, and the best is carbonized in ovens, while the worst varieties are those which come from the gas-house, and have been carbonized in retorts. It should be almost pure carbon, having in addition only the mineral constituents or ashes of the coal from which it was made.

Brown, or soft coal, is well known by everybody; it breaks in layers, is shiny when broken, but quickly loses that appearance, blacks the fingers when touched, and contains a great quantity of tar; the various varieties contain from 60 to 90 per cent of carbon, and all give forth, in burning, a dense, black smoke, owing to its want of compactness, and imperfect combustion. The great beds of soft coal are in Great Britain, of which a great quantity, nearly one quarter of her whole area, is coal.

Peat is semi-fossilized vegetable matter, or rather woody fiber in a state of semi-decay; it occurs in bogs, of which those of Ireland are notorious. It is cut in square blocks and dried, when it forms a good and pleasant fuel, and has a peculiar odor, that is considered agreeable by those who use it. A very good quality of charcoal can be made from it, that is of great value in certain smelting operations; and we are inclined to think that peat is destined to enjoy greater respect, as an object of economical use, than it yet has done.

Wood is the oldest used of all fuels, because the most easily attainable. Of wood, ash, fir, lime and elm are the best, and next to these come poplar, sycamore, beech and oak, in point of economy. But in all cases, the choice of fuel must depend more on locality than on philosophical principles; and we have but given the result of much patient investigation and actual experiment.

Motion and Motors.

The question "What is motion?" is so often asked, and just as often unsatisfactorily answered, that we will endeavor to throw some light on the subject. When a body occupies successively different positions in space, we say it is in motion. A log which rolls along the ground, a horse that walks along a road, a boat descending a river with the current, are instances of bodies in motion. Each of these changes its position in regard to objects which we call fixed, although really there is no stand-still in nature; but as we relatively take part in the same motion as the trees, the hills and other land-marks, to us they appear as fixed. To return to our question "What is motion?" we reply, motion is the result of the action of the elemental forces of nature; and as they are always at work, and ever have been, motion is eternal, illimitable, and all-present. We call these forces electricity, magnetism, gravity, attraction, chemical action, and life, together with heat and light. To these forces may be traced all the wondrous changes of nature that are daily going on around us; and to the application of these forces to our own wants and requirements, we ascribe all that man has done to render easy the high roads of civilization, and make ways for truth through the trackless ocean. Nature is the prime action, and art the combined and controlled action of them; or, in other words, in nature they act governed only by their own laws, and in art their laws are made subservient to the wants of man. The planets in their movements around the sun, the sun carrying, by the force of his attraction, the planetary system through space, the motions of all the heavenly bodies, are the result of combined atmobility and gravity. The trees growing in the field, animals increasing on the earth, and man standing as a presiding genius over the whole, owe their existence to life and chemical action. The rock crumbling under the action of the weather, the steamer crossing the mighty deep, the locomotive pursuing its undeviating path, are the results of heat. Light shines everywhere, and influences all created things. These are the motors of creation out of the power of man to create, but in his power to control.

Venturing cautiously a little deeper into the subject, we find that all the above mentioned forces are related intimately the one to the other, and that in many instances, one can develop the rest. Thus, electricity can develop heat, light, magnetism, attraction, and chemical action, but not gravity or life, for life, we know, is the direct gift of a Higher Power; and it would really seem that all these which we now call separate and distinct are but the developments of one great force which yet remains to be discovered.

Much has been said and written on this subject, but without contributing any great amount of knowledge to that already in our possession, as each author has taken more trouble to prove some theory of his own than to investigate the simple truth. This much, however, we know, that the above are the fountains of motion, and there are no effects that cannot be traced to them.

Trial Trip of the Adriatic.

The long expected trial trip of the *Adriatic* has been successfully made, and the ship is now on her first voyage to Liverpool. It is the wish of all America, and it is, perhaps, just to say, of the world, that she may prove superior to any steamship previously constructed. She is, certainly, the largest yet afloat; and during the latter hour of her trial trip made the greatest speed on record, for vessels of her class. In coming up the harbor on Monday morning, the 16th inst., she ran from an accurately-ascertained point off Sandy Hook, to an equally definite point near Governor's Island, a distance of 21½ statute miles, in one hour and four minutes. This is a trifle over twenty miles per hour. Long and sharp river steamers have frequently moved from twenty to twenty-five miles per hour, but heavy sea-going vessels rarely exceed sixteen. The great speed of the ship in this instance should not, however, lead to too extraordinary expectations in regard to her general performance, on account of a circumstance not alluded to in the daily papers—the disuse of her "cut-off" during the whole trial. On starting from the dock it was found that the valves slammed too violently when dropped in the manner intended, and the engines were, consequently, adjusted to work with the steam following the piston at full pressure during the entire stroke. This method of working consumes steam very rapidly, and develops somewhat more power than when worked properly; and the rapid run was probably due to the fact that a high pressure of steam existed in the boilers at the commencement, and was expended to develop extraordinary power in running down as she neared her dock. The "dash pots," as the parts are technically termed which check the descent of the valves, are to be replaced by larger or more efficient ones.

The trial trip, so far as it was a trial, was successful, but it demonstrated nothing definite with regard to the working of the valves, nor with regard to the normal speed of the ship under proper conditions. The model appears to be, as was generally expected, exceedingly well adapted to high speed, and the heavy work of the engines has been proved admirably perfect. It is yet possible that the valve gear will be subjected to several alterations, though nothing has been definitely proved that points to such a necessity.

Indemnity to the Widow of an American Inventor.

Some months ago, Charles Morey, an American inventor, was temporarily imprisoned at Paris, and while gazing out of the window of the prison, was suddenly shot dead by a soldier on guard below. The soldier had misconstrued the orders of his superior officers. Through the efforts of the American Minister, Mr. Mason, the French government has lately been induced to grant to Mrs. Morey, the widow, the sum of $15,000, as indemnity money for the loss of her husband.

Charles Morey was well known in this country, for his inventions. Morey & Johnson's patent was one of the earliest sewing machines—a species of mechanism that is now rapidly finding its way into every household.

An Interesting Spectacle.—A political party in the City Hall Park (New York), rejoicing over a victory by consuming a generous quantity of powder at fifty cents a pound, and having for spectators a crowd of *starving* people smoking segars.

A Model.—We have received a model of a mathematical instrument, which awaits proper advices from the inventor. There is no name on it, therefore we cannot find out its origin.

Attempted Launch of the Great Eastern.

On the morning of the 3d inst., an attempt was made to launch this colossal steamship into the river Thames, London. It was the first and only trial, and the effort to move her beyond a few feet totally failed, and the gigantic vessel, which ere this should have been a "monster of the deep," remains as firm, if not firmer, than ever upon the river's bank. For another month, at least, if not for a longer period, the launch has been postponed, and the 2d of December has been fixed as the earliest period on which the next effort can be made.

During the whole of Monday night the workmen were retained in the yard removing the struts and shores which supported her on the side towards the river, and before dawn on the morning of the 3d, the last beam had been entirely taken away. Then, for the first time, the whole length of the vessel, from stem to stern, was visible without the slightest break. The graceful sweep of her lines, the clear sharp run of the bows and sweep of the stern could be appreciated at a glance. The last supports were not removed until every precaution had been taken to ascertain that she was securely stayed by her check tackle, and that there was no fear of her suddenly gliding down the "ways" and launching herself.

Four large lighters were moored in the tideway, and worked with crabs and sheaves upon the chains, which were fastened to the vessel amidships. Each of these four lighters was capable of applying a strain of sixty tuns, all of which was to be used to draw the vessel down the launching ways in case of any *contretemps* which might prevent her running. Two lighters were also moored at the stem and two at the stern of the vessel. The chains passing from the ship to these latter were returned again on shore, so as to be worked with a double purchase. Small stationary engines on land were used to haul in these, and made the whole force available to pull the vessel off the shore upwards of 600 tuns.

These were the means taken to draw her down to the water, but the greatest efferts of Mr. Brunel were, of course, concentrated in the check tackle which was to pull her back, and prevent her dashing into the river at the fearful momentum of 12,000 tuns weight, sliding down an inclined plane of 1 in 12. For this purpose two most powerful drums had been constructed, to which the cradles were attached by enormous sheaves or pulleys of cast iron, expressly cast for this purpose, and weighing five tuns' each. One sheave was fastened to each cradle, and wrought iron chain cables of the largest size connected these with two other sheaves, each of which was secured to the drum, which paid out the chain, and, in fact, regulated the whole operation. These drums and the framework on which they rest having to bear the strain of the whole mass in motion, extraordinary precautions were taken to render them as massive as they could be made by any knowa combination of wood and iron. The shape was that of an ordinary reel, the axle of which was formed by beams of timber and strips of wrought iron bound together so as to form a drum about twenty feet long and nine feet in diameter. At each end of the cylinder are the wheels of the drum or disks, sixteen feet in diameter, each of solid iron, and weighing upwards of twenty tuns, so that the weight of each drum is more than sixty tuns in all. The axle of the disk is set in a frame of iron, while around its upper edge passes a band of wrought iron to work in the manner of a friction clutch or break. This, with the aid of strong iron levers 20 feet long, brings such a pressure to bear upon the disks of the drum as to lower its rate of revolution, or entirely stop them in case of the chain being paid out too fast. These drums are set in a solid bed of wood formed by driving down masses of piles into the gravel, so as to form a mass of timber twenty feet square. This is bound together with iron, and strong shores pass from the cube of piles to the bed of the piles on which the launching-ways are built. So that, in fact, no matter what the strain, it is impossible for the setting of the drums to give, unless the whole river's bank gives way with them. One of these drums is built opposite each cradle—the chains used between them and the cradles are the chain cables of the great ship itself, which are 2⅝ inch in diameter, or about sixty pounds the link. Between each drum and the cradle on which the vessel rested, a hydraulic ram is fixed to "start" her. That at the forward end gives a pressure of 600 tuns, the one at the stern 1,000.

The launch was fixed to commence at 11 o'clock, but things were not arranged for the moving of the monster when that time came. Gangs of men were employed in hauling chains, in clearing away the slightest obstacle upon the ways, and giving the metals the final coating down of black lead and oil. Mr. Brunel's position was high up in a little rostrum fixed on the inner side of the vessel. From this point he was to regulate the advance of stem and stern by signals, which were communicated to the gangs of workmen, both to pull her off and hold her back, by means of flags—a white flag being the signal to haul together, and a red one to cease on all points.

At the signals, the lighters slowly but steadily commenced to haul taut their tackle from the river, which, it was thought, would of itself be sufficient to bring the vessel gently down. It appeared, however, to have no effect beyond once or twice producing in the vessel itself a sullen, rumbling noise like distant thunder as the great strain told upon her hull. It remained thus for about ten minutes. Expectation was wound up to the highest pitch, when the peculiar hissing noise of the hydraulic rams at work to push her off was heard. We should have mentioned that each of the drums was constructed so as to be turned by ordinary windlasses, in order to wind up the slack chain between the drums and the cradles, otherwise if any slack was left when the hydraulic rams started the vessel, it would run it rapidly out, and Heaven only knows the consequences that might ensue. When the "rams" began to work, the order was distinctly given to "wind up," meaning to coil in this slack between the drum and the cradle. This was accordingly done at the forward drum, but, unfortunately, at the stern of the vessel the men did precisely the reverse, and uncoiled more slack chain. Suddenly, there was a cry of "She moves, she moves!" the fore part of the vessel slipped, and the stern rushed down rapidly. It seemed to slip some three or four feet in the space of a couple of seconds, in consequence of the slack chain from the after drum offering not the slightest check. In an instant the strain came upon the drum, which was dragged round, and, of course, as that was connected with the windlass by multiplying wheels, the latter turned some ten or fifteen times for every foot the drum moved. The men at the windlass madly tried to hold it, but the heavy iron handle flew round like lightning, striking them and hurling five or six high into the air as if they had been blown up by some powerful explosion. A panic seemed to spread as this shocking accident took place, and the men stationed at the tackle and fall of the level next the windlass rushed away. Fortunately, most fortunately, for the lives of hundreds of the spectators, the men at the lever at the other side of the drum stood firm, and hauling on their tackle drew their lever up and applied the break on the drum with such terrific force that the ship instantly stopped, though she seemed to quiver under the sudden check as if she had received a heavy blow, and the check tackle and massive pile of timber which controlled the drums strained audibly.

The whole of this took place in the course of two or three seconds. The vessel dropped, the men were hurled from the windlass, and with a heavy rumbling noise, the tremendous structure was still on the "ways" again, almost before the spectator had time to imagine what had occurred.

This melancholy occurrence seemed to exercise a most depressing effect, especially upon the workmen, though the tremendous strain to which the drum was exposed, and which even with the friction of only one break proved sufficient to check the vessel with a great and unexpected momentum on her, shewed that the check tackle was all that could be desired. An examination of the place where the accident occurred showed that the toothed wheels of the windlass (which seemed totally insufficient in multiplying power to enable the men to exercise any check upon the revolution of the drum,) were broken, and appeared so out of gear that they were almost useless. Beyond this damage, which was of not the least importance, the rest of the apparatus of the drum and framework was as firm as ever. The vessel it was found had slipped down the ways about three feet at the forward drum and four feet three inches at the one fixed aft. The stern had progressed, of course, about six feet towards the river.

Later in the day another attempt was made to carry the "Great Leviathan" into the destined element, but without success. As all further attempts toward launching have been definitely postponed till the 2d of December, it is not impossible that the fears as to her settling down in the "ways" may be realized before that time arrives. With a weight of some 12,000 tons resting upon new made earth, the safety of the vessel may become at any time a question of considerable doubt.—*London Times.*

The Sorghum Sugar Question.

On page 411, Vol. XII., of the SCIENTIFIC AMERICAN, and in subsequent numbers, we expressed our opinion that crystallizable sugar was not obtainable from the Sorgho cane. We did so, having the authority of eminent chemists and practical refiners to support our opinion; and as far as they had examined, they were right. But neither they nor we had gone quite far enough, for we have received a sample of beautiful crystallized sugar, prepared by Mayland Cuthbert, of Philadelphia, also some samples of the same from E. G. Ward, of New Bedford, Mass., equally good. We carefully examined them and were at a loss to account for it. Has the great problem of converting syrup into sugar been solved? thought we; it cannot have been. We were in an inexplicable difficulty concerning this phenomenon until we saw a communication in the *Prairie Farmer*, from Dr. Ostrander, of Lexington, Ill., whose experiments, if confirmed by subsequent investigations, seem to solve the difficulty. He says:—

"I purchased a sugar (crushing) mill of two iron rollers, 5½ inches in diameter, and 14 inches long, and had new gear wheels cast, both of a size, to give equal motion to the rollers. I commenced grinding and boiling, and soon found that six gallons of juice would make one gallon of superior syrup. I then built a mill with wooden rollers, 18 inches in diameter, and went at it in good earnest, and found that it now took eight gallons of juice for one of syrup. Upon investigating the cause, *I found there were two juices distinct from each other in the cane, viz.: a crystallizable and an uncrystallizable saccharine juice.* The iron rollers expressed both, the wooden rollers only one. The juice run from the iron rollers granulated easily, while the juice from the wooden rollers could scarcely be said to grain. My cane was twice frozen solid before it was worked or cut."

The above announcement will stimulate additional researches into the nature of the Sorgho plant, and we shall hope to see Dr. Ostrander's position carefully tested. If found to be correct its future value for sugar-making will become a question of importance in an economical point of view.

FRENCH SILK MANUFACTURE—The production of cocoons in France has been diminished from about 58,500,000 pounds in 1853, to about 15,750,000 in 1856. The aggregate production of silk in the world is estimated at a value of $200,000,000.

Improved Method of Bleaching Straw Hats.

This method is described as far surpassing, in efficiency and beauty of result, any other known process. The soap is brushed off clean with a delicate brush. The hats, while yet wet, are immersed in a bath, prepared of three-fourths of an ounce of sulphite of hydrosulphite of soda, and four to six pounds of water, and are freely handled and pressed, to promote the soaking in of the lye through the interstices of the plaits. No harm is to be apprehended from this manipulation, as the previous washing has rendered the straw pliable, and without danger of fracture. The hats are then removed from the lye, and three-fourths of an ounce of muriatic acid of commerce being added and well stirred into this lye, the hats are quickly replunged in it. To secure a uniform action of the acid upon the lye which is in the hats, particular care must be taken that the hats be submerged at once, and kept in this situation. In order to prevent the escape of the liberated sulphurous acid gas, the vessel employed is, after the second immersion kept closed, until the operation be completed; this takes place in about thirty minutes, more or less, according to the darkness of the straws. When sufficiently acted on by the gas, the hats are removed, washed clean in pure water, dried, and finished as usual.

Genius and Labor.

There are a great many well-meaning persons who are horrified at any innovation upon the established order of things. They are vexed with even the slightest efforts to introduce new customs or new improvements. If some ingenious inventor proposes to invent a sewing machine or a wood planer, they cry out that genius thus exercised is against the interests of labor. The experience of the world is, however, against the croaking of such philosophers. Every labor-saving machine lends not only dignity to labor, but it also increases the demand for the articles manufactured by it. The history of every manual labor-saving machine is emphatic on this point.

Tears.

How many associations of joy and sorrow are conjured up by that one word, but we are not going to be sentimental, so we shall stick to the science of them. They are a peculiar limpid fluid secreted by the lacrymal or crying glands, and are intended to preserve the transparency of the cornea of the eye by keeping it moist, and removing foreign substances. In man the passions excite their flow, but it is questionable if they are so caused in the lower animals. Their specific gravity is somewhat greater than that of water, and they contain common salt and free soda, they change vegetable blues to green, in one hundred parts there are only four of solid matter, one of which is salt, the rest being mucus, which separates in flakes when alcohol is poured on them.

Mosquito Tobacco.

Mosquito tobacco is used in China for protection from what is to us a great summer pest. The ingredients are pine and juniper sawings, wormwood leaves, and tobacco leaves reduced to powder, a small portion of *un-wang* and arsenic. The quantity of the latter is exceedingly small, and can hardly be injurious to health, as this tobacco is used by probably one hundred million human beings. The odor is not at all disagreeable. It is no luxury to the mosquitos, for in two or three minutes after it is ignited, not a bug or mosquito is to be seen.

Acknowledgment.

We are indebted to C. F. Loosey, Esq., Austrian Consul-General, residing in this city, for files of the *Journal of the Society of Austrian Engineers.* The government of Austria has already experienced the benefits which result from the careful attention given to the progress of mechanical science by its New York Consul-General.

Correspondents

S. W., of N. Y.—We think the elastic webbing mentioned by you can be procured of H. H. Day, No. 23 Courtland street, this city.

F. P., of D. C.—Your suggestion in regard to a price current is a good one, but we have generally considered that our readers would prefer the same space to be filled with other matter.

E. G. W., of Mass.—You assert that sweetness is a positive indication of sugar in substances. This is not so; for there are various metallic salts which are very sweet to the taste, such as the acetate of lead.

B. E. C., of Md.—We thank you for your communication, and should be happy to publish diagrams of the plane for grooving circular timber, if the invention was public property, so that our readers could have the benefit of the invention; but it is nearly the same as one patented by W. A. Cole, in 1848. We shall be happy to receive communications from you again on similar practical subjects.

A. W., of Me.—If you were to force air into the boiler at the pressure you speak of, (100 lbs. per inch), the water would not boil, or steam be generated, till it had been heated to a temperature of nearly 330° Fah. It would require more heat to give a corresponding increase of elastic force to air at that pressure than if it were at a lower pressure.

R. H. C., of Texas.—The great philosopher and traveler, Baron Humboldt, is still alive, and lives in Berlin; he is now very old, put his memory is perfect, and his habits are quiet, but cheerful. You are right in saying that he is one of the greatest men the world has ever produced.

L. P. S., of Conn.—The magneto-electric machine of Saxton has been so improved as to produce a continuous current, but we do not know whether it has been applied economically to electro-plating, although a patent was taken out for this purpose some years ago, by Mr. Elkington, of Birmingham, Eng. Calvin Carpenter, of Providence, R. I., has a patent for economising the power of such machines. We cannot tell you what size of magnet is required to do the work of a four-cell Smees' battery.

F. D., of N. Y.—The coloring ingredient of indelible ink is nitrate of silver, To make the ink, dissolve ten grains nitrate of silver in twice that quantity of aqua ammonia, and add to it a weak solution (weighing one ounce) of gum arabic. Keep this bottled for use. Write on the cloth to be marked, and expose it to sunlight until it is dry.

C. D., of Pa.—Taylor's work on coal statistics, published by J. W. Moore, Philadelphia, is the best we can recommend on the subject; it contains the information you desire.

H. P. D., of N. J.—Hollow and solid cast iron shot are now used to obtain balls of different weights from the same material. We therefore cannot see what advantage would be secured by the use of a metal of less specific gravity, even if it were equally hard.

E. R. M., of Ala.—The current is less rapid at the bottom, than at the surface of a river, especially near the middle, owing to the resistance of the bottom. The hydraulic force, therefore, which acts against your paddle, must be greatest at the surface of the water, because the power is in proportion to its velocity and volume.

L. A. J., of Me.—You cannot make a good foundation for a road across marshy land without driving piles on either side, and filling in with large boulders, gradually diminishing the size as you ascend. Should no boulder stones be available, a good road for cattle and light weights may be made by digging a deep ditch on both sides, narrower at bottom than at top, and having a slight fall to carry off the water.

S. E. D., of Miss.—The architecture of the Anglo-Saxons was of a very rude character, for we find that in the year 627, the church at York, Eng., was built of wood, and covered with reeds, the only parts composed of stone being the altars. The first stone church was built in the latter part of the seventh century.

John H. Martenstein, of New Orleans, is desirous of obtaining the address of the person whose idea of perpetual motion we published in No. 9 of the present volume.

B. F., of Ind.—The ordinary proto-nitrate of cobalt will make an invisible ink for use. It may be made by dissolving cobalt in nitric acid.

J. K., of Ga.—The present volume of the London *Engineer* contains much interesting correspondence on the subject of aerial navigation; you had better obtain it. The address is 301 Strand, London.

W. J. F., of Del.—The best works on mechanics are Bartlett's Mechanics, published by Barnes & Co., New York, and the Mechanics' Text Book, published by Phillips, Sampson & Co., Boston. Should you wish to learn the first principles, any of the hand-books on the subject would answer your purpose.

D. C., of Md.—The assignee of a patent holds the right to the portion so assigned, if only one dollar is specified in the contract, regardless of the great value of the patent, and the verbal understanding that you should be further remunerated. The amount of consideration specified in an instrument of this kind does not affect its validity.

W. W. D., of Cal.—Your English and French patents were shipped to you on the 30th inst. by Wells, Fargo & Co.'s Express. The American case is not being neglected; you will hear from it soon.

Rusticus, of Texas—You are entirely wrong, as we are not aware that it ever was "a prevalent notion that sound travels faster in warm than cold air" so you have been fighting against a fallacy. Your method of measuring vibration is good. The edition of Graham's Chemistry must be old, or you would find that he doubts his former statement in regard to sulphuric acid, and that if it ever does exist, it immediately combines with water.

T. W. B., of Wis.—Your boat hung on journals is an old idea. The umbrella-like construction of the boat was patented two or three years ago.

J. A., of Conn.—At present there is no law in Canada by the aid of which patents can be issued to American citizens.

W. B. P., of Mass.—Your communication will receive attention next week.

C. C. T., of Wis.—We will hold the assignment until the recording fees are paid. The assignee's neglect, in this instance, cannot affect your interests. The patent will issue in your name, if granted.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, November 21, 1857:—

A. S., of N. Y., $30; L. T. W., of Ohio, $25; R. N. W., of Ohio, $25; H. S., of Ohio, $70; J. R. V., of Cal., $50; J. H. F., of Cal., $30; J. E. H., of N. Y., $30; J. K. B., of N. Y., $20; J. L., of Mass., $25; L. E. P., of Wis., $55; S. M., of Ohio, $25; J. M. S., of Conn., $25; V. N. M., of N. C., $30; J. D., of N. Y., $10; S. P. C., of Ohio, $25; J. R., of Ill., $30; J. H. H., of Pa., $25; D. D., of Pa., $25; H. U., of N. Y., $10; S. O., of Ind., $30; S. C., of S. C., $25; A. M., of N. Y., $25; F. B. B. of N. Y.. $225; T. & T., of Ohio, $30; H. B., of N. Y., $100; J. L. W., of Pa., $100; J. W. L., of Ill., $25; G. W. H., of Conn., $60; E. H. T., of N. Y., $25; H. W., of Mass., $55; T. D., of Ala., $20; G. H. H., of Conn., $60.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, November 21, 1857:—

J. M. S., of Conn.; E. M., of N. Y.; S. M., of Ohio; J. R. V. O., of Cal.; R. N. W., of Ohio; J. L., of Mass.; A. M., of N. Y.; N. A., of Conn.; D. D., of Pa.; E. H. T., of N. Y.; S. P. C., of Ohio; J. H. H., of Pa.; J. B. E., of Pa.; J. W. L., of Ill.; H. W., of Mass.; T. D., of Ala.

Literary Notices.

THE CHARLESTON MEDICAL JOURNAL AND REVIEW—Dr. Huppoldt, editor and publisher. The November number contains much valuable and scientific information in the medical sciences, and has an able translation of M. Florens' lectures on Comparative Physiology, and a few valuable suggestions on "Malaria."

REPORT ON INFANT MORTALITY IN LARGE CITIES—By D. Meredith Reese, M.D., LL.D. T. K. & F. G. Collins, Philadelphia. This pamphlet, which is extracted from the transactions of the American Medical Association, is a valuable contribution on this subject, and exhibits great research on the part of its author. It is a topic that should be more closely attended to and studied, so that many of the causes may be removed. He tells us the astonishing fact that infant mortality is greater in American cities than in Paris, and gives some clue to the causes.

HISTORY OF PETER THE GREAT.—By Sarah H. Bradford. Appleton & Co., publishers, New York. The life of this great man is well and pleasantly told, in a style suitable to children: and perhaps the reading may stimulate boys to follow the energy, perseverance and courage of the hero of this biography.

CHILDRENS' HOLIDAYS: A Story Book for the Whole Year.—Appleton & Co., New York. This little work is full of pretty stories, all tending to the moral improvement of little readers.

GEORGE READY, OR, HOW TO LIVE FOR OTHERS—By Robert O'Lincoln. Appleton & Co., New York. A Christmas story, with a boy for hero, plenty of pictures, and full of interest.

A PLACE FOR EVERYTHING AND EVERYTHING IN ITS PLACE—By Alice B. Haven. Published by Appleton & Co., New York. Another story for children, inculcating the moral indicated by its title—one that cannot be too early instilled into the minds of the young, that they may be orderly by force of habit in their later years.

TO OUR SUBSCRIBERS.

GIVE INTELLIGIBLE DIRECTIONS.—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the Post Office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the Post Office at which they wish to receive their paper, and the State in which the Post Office is located.

RECEIPTS.—When money is paid at the office for subscription, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona fide* acknowledgment of the receipt of their funds. The Post Office law does not allow publishers to enclose receipts in the paper.

SUBSCRIBERS TO THE SCIENTIFIC AMERICAN who fail to receive their papers regularly, will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication.

EVERY SUBSCRIBER would do well to try and get one or more of his neighbors to send their names with his own, even if he has no wish to avail himself of our club rates. The larger the package of papers sent to one address, or the same Post Office, the greater is the certainty of getting the paper regularly. A single paper is sometimes mislaid or overlooked in sorting the mails at some one of the intermediate post offices through which it has to pass; while, on the contrary, we have noticed that a large package seldom fails to reach its proper destination.

Science and Art.

Creosote a Cure for Dysentery.

The Nashville (Tenn.) *Journal of Medicine and Surgery* contains an article on the above subject by J. W. Brown, M. D., the substance of which will be of interest to many of our readers. He states that dysentery is the principal disease with which the physician has to contend in Tennessee, Arkansas and North Louisiana, and in some localities the mortality is frightful. Drs. McMath and Weilder, of Louisville, Ark., informed him that they had treated three hundred cases of the most aggravated form with success by the use of creosote, and in every case in which it was given (if not delayed too long), a marked improvement invariably took place.

The following is the formula used by these gentlemen:—Creosotum, 10 drops; acetic acid, 20 drops; sulphate of morphine, 2 grains—all mixed in an ounce of distilled water. A teaspoonful of this is given every three or four hours to adults; smaller doses are given to children in gum arabic mucilage. Drs. McMath and Weilder consider it nearly, if not entirely, a specific in dysentery.

This disease is sometimes very fatal and prevalent in all parts of our country, and children about two years old, in the cities, are very liable to be attacked with it in the months of July, August and September. Creosote and morphine alone, we understand, are given in such cases by our New York physicians, but with what general success, we can not tell. If the above recipe is a certain remedy for the disease, a knowledge of this fact should be promulgated to the ends of the earth.

Railway Accidents and a Uniform Speed.

At a late meeting of the National Association for Promoting Social Science, held in London, Lord Brougham read a lengthy paper on the prevention of railway accidents, in which he took the ground that the speed should be fixed by law, and should be moderate, not exceeding twenty or twenty-five miles per hour. He asserted that a very small number of travelers were willing to risk life and greater danger in order to save time by a high speed in traveling, while the great majority would prefer a moderate speed and greater safety. He alluded to the immunity from accidents on the railroads in continental Europe where the speed is regulated by law, and suggested the application of the same laws to British railroads.

It is unquestionably true that there is greater safety in traveling at a low than a high speed on railroads; but safety does not altogether depend on the speed of the train, but a number of other equally important conditions, such as the solidity and construction of the road itself, also the engines and cars, and the skill and carefulness of the engineers and conductors. It is just as safe to run thirty miles per hour on our present railroads, with their heavy rails, as it was to run at the rate of fifteen miles per hour on the old flat strip rail tracks employed on our first railways.

Halos.

Luminous circles called "halos" have often been observed surrounding the sun and moon in certain conditions of the atmosphere, usually more or less colored. They are of two kinds, one kind of small dimensions, which are generally composed of two or three rings; they appear when a small quantity of aqueous vapor is diffused through the atmosphere, or when light fleecy clouds pass over the sun or moon. These are usually called *coronæ*. The second kind are much larger, some measuring from 44° to 46° in diameter. The lunar halo is a simple white luminous circle, without color, excepting a pale red, which sometimes fringes the inner edge. The solar halo is a beautiful play of colors; although not so bright as those of the rainbow, they are marked with sufficient distinctness to be seen. The red occupies the inner part of the circle, the violet and indigo the outer, and they shade away until lost in the surrounding space. Sometimes a secondary circle, full of bright spots, or parhelia, is seen.

Various reasons have been assigned as the cause of these phenomena, but the most probable is that of Mariotte, who supposes they are due to the refraction of light through the transparent and prismatic crystals of ice which float in the upper regions of this atmosphere.

Photographing on Wood.

On page 390, Vol. XII, SCIENTIFIC AMERICAN, we published an article on this subject, which was copied by the London *Illustrated News*, among whose correspondents it has created much interest; one of them, however, sends us a copy of a letter from a Mr. Francis, dated April, 1839, which was published in a defunct periodical called the *Magazine of Science and School of Art*, describing the whole process, exactly similar to the one we made known. This is certainly a fact worth knowing, for we were of the opinion that our side of the Atlantic had produced the first practical process of photographing on wood. We now admit the English priority of invention, for we find that a specimen of lace, two flowers, the fool's parsley, and grass of Parnassus, had been engraved from a block thus prepared as early as 1839.

The Use of Bones.

A. E. Schmersahl, of England, has patented an improvement in the manufacture of gelatine, glue and manure from bones. The patentee obtains bones, and separates from them blood and such other substances which are soluble in water, so as to deprive them of putrescent matters, which, according to the usual manufacture, become mingled, or partially so, with the gelatine, &c. The bones thus purified he treats with an acid, in order to dissolve the phosphate, or other salt of lime, leaving the gelatine in a solid state, which after being washed, may be used as an article of commerce, or boiled into a paste or jelly, ready for immediate use. The liquor in which the bones have been macerated he reserves, and extracts therefrom phosphorus or sal-ammoniac, and superphosphate of lime, applicable as a manure.

Scriptural Statistics.

The "book of books" has been studied in every shape and way, and yet it is not studied half enough. We hope to see the day when every family will possess one, not for the sake of its handsome binding, but for the inestimable value of its contents.

Some one has been exercising his patience in a peculiar way upon the Bible, for the "Union Bible Dictionary," published by the American Sunday School Union, contains the following information:—

The Old Testament contains 39 books, the New Testament 27; in all, 66. The Old Testament contains 929 chapters, 23,214 verses, 592,439 words, and 2,728,110 letters, while the New has 260 chapters, 7,959 verses, 181,253 words, and 838,380 letters; making a total of 1,189 chapters, 31,173 verses, 773,692 words, and 3,566,490 letters.

Mortar.

The ancients made a kind of mortar so very hard and binding that it is now found to be almost impossible to separate the parts of some of their buildings. The lime used in these harder mortars is said to have been prepared from the very hardest stones, sometimes from marble. Fine sand makes weak, and coarse sand strong mortars, and the sand should be washed before mixing, to obtain the large grains. The lime should be thoroughly burned, and perfectly white. The principle on which it hardens is, that the lime absorbs carbonic acid from the air, and hardens, forming a concrete round the grains of sand. It was customary to mix with the lime and sand chopped straw, but cow's hair has been substituted; this is only introduced to cause it to bind together, and prevent cracking in the drying. It is only used for the prime coat.

Wild Silk.

The depths of the Central American forests will probably yield some new articles of commerce. In the Olancha there is found hanging from the trees a sort of sack, some two feet in depth, which is the nest of a species of silkworm. The silk is woven over the inside of this sack. In 1844, six pounds were sent to England, where it was made into handkerchiefs of excellent quality. A profitable trade in this article might, perhaps, be established, as this material can be gathered in any required quantity. An old Mexican author speaks of wild silk as abundant in the Isthmus of Tehuantepec, and states that the natives were accustomed to gather it for exportation to Spain.—*California Paper.*

Parachute for Mines.

The method of descending into mines by ladders is very fatiguing, and in consequence baskets attached to a rope are generally used. Should the rope break, the men in the basket are, of course, killed. Many mining engineers have proposed methods of removing this evil, and among the best is the safety cage of Mr. Fourdriner, of England. A Belgian engineer has recently proposed a kind of cage, so that if the rope breaks, its top will immediately expand into a parachute, and let the men down gently. The only objection to this is that parachutes are not to be depended on, as we know from the accidents that have occurred to many æronauts who have attempted to descend in them.

New Anesthetic Agents.

Some new bodies have been proposed to supersede chloroform, as a means of rendering a person insensible to pain during an operation. One of these is an organic compound called "amylene," a product of potato oil; another is oxyd of carbon. This is used externally on the diseased part; taken internally it is a poison, having ammonia as an antidote. The last is carbonic acid. The operation is performed under a stream of this gas, which produces insensibility in the part, and has been successfully used in the extraction of cancers, ulcers, and kindred diseases.

Electrical Illumination.

The city of Lyons, France, has been successfully illuminated by the aid of the electric light. Two pieces of apparatus were set up, at opposite extremities of the street, upon a frame crossing between the roofs of opposite houses, and so arranged that they sent their beams down the middle of the street. In one street, 550 yards long, it was usual to employ forty gas lights, which were fully replaced by the battery. It is important that the light should come from a greater hight, that it may be more diffused, and less blinding to the sight than it was found to be.

"Big Ben."

This large bell, which was said to have the sweetest sound, for its size, of any bell in the world, and which was intended for the new Houses of Parliament, London, is cracked, and will have to be re-cast. It was suspended a few feet from the ground, waiting the arrival of the four quarter-bells, before it was hoisted to its resting-place in the tower, and was regularly struck at one o'clock, to keep it in tune. The accident is supposed to have arisen from the fact that too large a hammer was used before it was properly hung.

How to Harden Gypsum.

It is known that calcined gypsum, after being moistened with a solution of alum and again burnt, acquires much greater hardness and solidity. Another process is to make a solution of one pound of borax in nine pounds of water, which is formed over the calcined fragments of gypsum. They are then kept at a strong red heat for six hours, ground to a powder and worked. The effect is said to be much better if a pound of tartar and twice the quantity of water are added to the solution.

Nicotine.

This peculiar principle is a product of the leaves and seeds of tobacco, by infusing them in acidulous water, adding lime, and distilling, and then washing the product with ether, when an ethereal solution of nicotine is obtained. One drop will kill a dog. It causes the pupil of the eye to contract, has a bitterish acrimonious taste, and a pungent smell, and on the whole, is one of the nastiest things in creation. It is composed of 73·26 per cent of carbon, 9·25 per cent of hydrogen, and 17·09 per cent of nitrogen. It is related to a class of bodies called vegeto-alkalies, and is capable of uniting with an acid. On the human brain it produces a soothing effect, which is thought very pleasant, but can never be considered otherwise than unhealthy.

A Chimney.

Professor Faraday has shown the chimney to possess very important functions in sanitary economy. Thus a parlor fire will consume forty pounds of coal in twelve hours, the combustion rendering 42,000 gallons of air unfit to support life. Not only is that large amount of deleterious product carried away, and rendered innoxious by the chimney, but five times that quantity of air is also carried up by the draft, and ventilation is thus effectually maintained.

EXPENSIVE FRESHET—It is estimated that half a million dollars' worth of property has been destroyed in the western part of this State by the freshets of last week.